Space Weather Forecast

Issued on Saturday, 19 February 2022 at 13:00 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: G1/Minor geomagnetic storm intervals Likely day 2 into day 3.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Very Low over the past 24 hours. There are currently three sunspot groups on the visible disc, which are small and relatively stable. The most complex sunspot region was inactive and is located in the southern hemisphere, near centre disc. No Earth-directed Coronal Mass Ejections (CMEs) were in evidence in available satellite imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind, was characterised by a slow regime, but with fluctuations in other measures, perhaps due to a close pass of a minor CME. The magnetic field ranged from weak to moderate. The all important north-south orientation was mostly weak and negative (southward) orientation during Friday evening. The net result of the above solar wind measures was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The high energy proton flux (related to solar radiation storms) has tracked very slightly above background levels after an evidently very large and energetic X-ray flare and CME seen on satellite imagery from the rearward eastern solar hemisphere on 15 February. This is unlikely to rise any further.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low or Very Low at first, given the sparsely populated Earth-facing disc, however there are indications that a large and potent region may rotate onto the facing side into the new working week. The magnitude of this increase will be assessed as and when the spot responsible becomes visible to analyse.

Solar Wind / Geomagnetic Activity: No CMEs feature in this forecast period. Solar winds should remain in a slow regime until the possible onset of a pair of coronal hole fast wind streams in succession late on day 2 or into day 3, likely giving G1 Minor Storm intervals on Sunday 20th February, and a chance of continuation on Monday 21st February.

Energetic Particles / Solar Radiation: No solar radiation storms are expected during the period, with the very slightly disturbed high energy proton trace continuing to relax through the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	60	40	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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